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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,934	04/01/2004	Jason Stuart Katcha	145806-1	2933

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EXAMINER

SUCHECKI, KRYSZYNA

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/708,934

Applicant(s)

KATCHA ET AL.

Examiner

Krystyna Suchecki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-17, 19, 21-24 is/are rejected.
- 7) ☒ Claim(s) 9, 18 and 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 04/01/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: paragraph 32 references the removal of weight from the rotating frame, and should reference that “there is also a counter-balance of equal weight that may also be removed”.
2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 10-12, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Beer (US 4,912,735).
5. Regarding Claims 1 and 11, Figure 3 of Beer teaches a multichannel, contactless power transfer system and same for a computed tomography (CT) system (Abstract), comprising:
 - a. an x-ray power inverter (74, 75) disposed on a stationary side of the CT system;
 - b. an auxiliary power inverter (not shown, Column 5, lines 35-37) disposed on said stationary side of the CT system;
 - c. a rotary transformer (36) having a primary side thereof disposed on said stationary side of the CT system and a secondary side disposed on a rotating side of the CT system;
 - d. said rotary transformer configured to couple x-ray generation power from an output of said x-ray power inverter to a high-voltage tank circuit (72) on said rotating

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side of the system, wherein said high-voltage tank circuit is further coupled to an x-ray generation tube (28B);

e. and said rotary transformer further configured to couple auxiliary power from an output of said auxiliary power inverter to at least one auxiliary voltage output (to power Accessories 85) on said rotating side of the CT system (Column 5, lines 35-37).

6. Regarding Claims 2, 12 and 22, Beer teaches a multichannel, contactless power transfer system and same for a computed tomography (CT) system and further teaches a multichannel rotary transformer as above for claim 11, wherein said primary and secondary sides of said rotary transformer further comprise concentric, E-shaped cores (Figure 5b).

7. Regarding Claims 10 and 21, Beer teaches a power transfer system, further comprising a power controller (81) disposed on said stationary side, said power controller configured to receive digitized power output information from said x-ray power voltage output and said at least one auxiliary voltage output, transmitted through a contactless communications link (82, 83), and wherein said power controller is further configured to maintain a desired voltage level for said x-ray power voltage output and said at least one auxiliary voltage output. Beer teaches this since the control (81) has two-way lead lines between various components in the system, which shows two-way communication between the components.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 4, 13, 14 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer.

10. Regarding Claims 3, 4, 13, 14 and 23, Beer teaches a multichannel, contactless power transfer system and same for a computed tomography (CT) system as above for claim 1 and also teaches that using multiple inductively coupled cores for power transfer should be considered when a number of accessories, such as rotating member- mounted detectors, are used (Column 5, lines 32-44). An E-shaped core is especially advantageous to supply power to an x-ray tube (Column 4, line 67- Column 5, line 17). Beer also teaches a first of said concentric, E-shaped cores of said secondary side of said rotary transformer is wound with a winding coupled to said high-voltage tank circuit (72, 78) used to generate said primary power voltage output

11. However, Beer fails to specifically teach that more than one E-shaped core should be used so that a first of said concentric, E-shaped cores of said primary side of said rotary transformer is wound with a winding coupled to the output of said x-ray power inverter; and a second of said concentric, E-shaped cores of said primary side of said rotary transformer is wound with a winding coupled to the output of said auxiliary power inverter. Beer also fails to teach a second of said concentric, E-shaped cores of said secondary side of said rotary transformer as wound with at least one winding used to generate said at least one auxiliary voltage output.

12. Beer does discuss a benefit of the E-shaped core to be a balance of the positive and negative voltages supplied across an x-ray generator. In order to keep this advantage in a "rotate-rotate" system (one with both detectors and source mounted on a rotating portion) Beer recommends another core for the detectors or other accessories, such a control information

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transmission unit (Column 5, lines 18-44). A possible benefit for including the second core set would be the customization of power supplied across the cores. This would benefit the accessories, such as the low-power control unit and detectors, since an x-ray source tends to require significantly higher voltages than other system components. By having a separate core set for the accessories, the possibility of applying too much voltage to the accessories is diminished.

13. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use another E-shaped core, with associated power inverter, for the accessories of Beer, since a second E-shaped core would give the accessories, such as detectors and control unit, a balanced power supply. The separate E-shaped core would also diminish the possibility of applying too much voltage to the accessories. The second concentric, E-shaped core of the secondary side of the rotary transformer would then be wound with at least one winding used to generate said at least one auxiliary voltage output to power the accessories.

14. Claims 5, 15 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer in view of Steigerwald (US 5,608,771).

15. Regarding Claims 5, 15 and 24, Beer teaches a multichannel, contactless power transfer system and same for a computed tomography (CT) system and a multichannel rotary transformer as above for claims 4, 14 and 23, wherein each winding in said primary and said secondary sides of said rotary transformer is arranged by configuring a wire within first and second channels of a corresponding E- shaped core (Column 3, lines 66- Column 4, line 12).

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16. Beer fails to teach each winding in said primary and said secondary sides of said rotary transformer as arranged by configuring a wire within first and second channels of a corresponding E- shaped core, beginning at a first opening in said corresponding E-shaped core, traversing circumferentially around said first channel, traversing a second opening in said corresponding E-shaped core, and traversing circumferentially around said second channel in the opposite direction to about said first opening.

17. Steigerwald teaches windings in a primary and a secondary side of a rotary transformer as arranged by configuring a wire within first and second channels of a corresponding E- shaped core, beginning at a first opening in said corresponding E-shaped core, traversing circumferentially around said first channel, traversing a second opening in said corresponding E-shaped core, and traversing circumferentially around said second channel in the opposite direction to about said first opening (Column 2, lines 41-50). The winding arrangement allows for magnetic field cancellation and creates a very small external magnetic field near a patient in a CT system (Column 2, lines 51-59).

18. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the winding arrangement taught by Steigerwald in the system of Beer since the arrangement would allow for magnetic field cancellation so as to create a very small external magnetic field near a patient in a CT system (Steigerwald, Column 2, lines 51-59).

19. Claims 6-8, 16, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer in view of Harada (US 6,674,836).

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20. Regarding Claims 6-8, 16, 17 and 19, Beer teaches a multichannel, contactless power transfer system and same for a computed tomography (CT) system as above for Claims 1 and 11.

21. Beer fails to teach an x-ray power inverter comprising a resonant network configured within a pair of output legs thereof or an auxiliary power inverter comprising a resonant network configured within a pair of output legs thereof. A leakage inductance of said rotary transformer used as part of a resonant network for said primary power inverter.

22. Harada teaches a contactless power transfer system and same for a CT system wherein a primary x-ray power tube and auxiliary power tubes are respectively powered via a power inverter comprising a resonant network configured within a pair of output legs thereof and an auxiliary power inverter comprising a resonant network configured within a pair of output legs thereof (Figure 6 and Column 7, lines 5-44). The leakage inductance of said rotary transformer is used as part of a resonant network for said primary power inverter as the capacitors are moved throughout the embodiments of Figures 3-7 (Column 7, lines 5-44, particularly, lines 21-32). The resonant networks enable high-frequency operation and effective use of primary-side leakage inductance (Column 7, lines 18-32).

23. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the resonant networks within a pair of output legs of the power inverters of Beer as taught by Harada since the networks enable high-frequency operation and effective use of primary-side leakage inductance (Harada, Column 7, lines 18-32).

Allowable Subject Matter

24. Claims 9, 18 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

25. The following is a statement of reasons for the indication of allowable subject matter:

Claims 9 and 20 contain allowable subject matter for at least the reason that the prior art of record fails to teach or fairly suggest a power transfer system having primary and auxiliary power inverters disposed on a stationary side of a system, a secondary, rotating side of the system and rotary transformer to couple primary and auxiliary power from the stationary side to the rotary side wherein a leakage inductance of the rotary transformer is used as part of a resonant network comprising a pair of resonant capacitors configured within the primary side of the rotary transformer for the primary power inverter as claimed. Claim 18 contains allowable subject matter for at least the reason that the prior art of record fails to teach or fairly suggest a multichannel, contactless power transfer system for a CT system comprising a power transfer system having x-ray and auxiliary power inverters disposed on a stationary side of a system, a secondary, rotating side of the system and rotary transformer to couple x-ray and auxiliary power from the stationary side to the rotary side wherein the x-ray and auxiliary power inverters comprise a respective resonant network comprising a plurality of inductive and capacitive elements equally divided between a pair of output legs as claimed.

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ueoka (US 5,449,979) and Weil (US 3,893,015) teach transformer systems having a

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pair of capacitive elements (31 and 32, 28 and 29, respectively) near the transformers, but fail to teach the capacitive elements as parts of resonant networks on the output legs of power inverters.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495.

The examiner can normally be reached on M-F, 9-5.

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Craig E Church

Craig E. Church
Primary Examiner